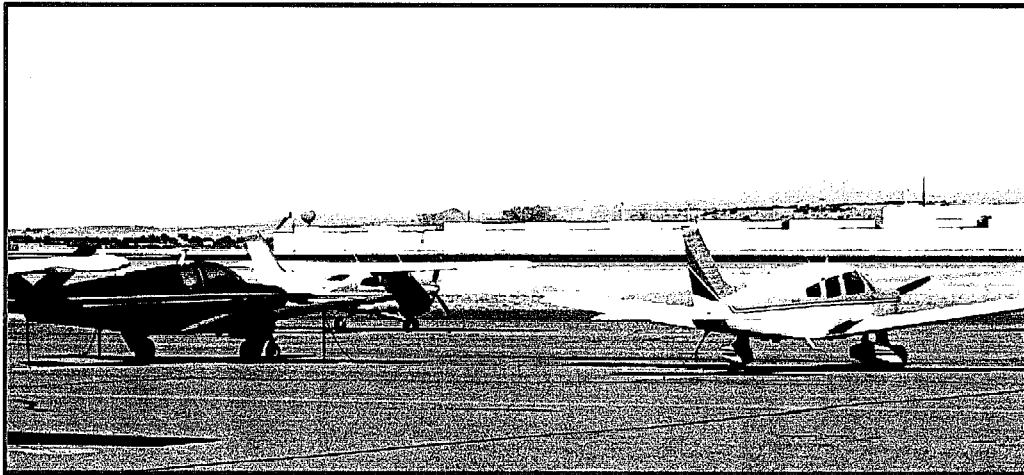


Chapter Two
AVIATION DEMAND FORECASTS

AVIATION DEMAND FORECASTS



The proper planning of a facility of any type must begin with a definition of the needs that the facility can reasonably be expected to serve over the specified planning period. At Ernest A. Love Field, this involves the development of a set of forecasts that may best define the potential of future aviation demand. Forecasts of aviation activity at the airport can be used as a basis for determining the types and sizes of facilities required to meet the aviation needs of the airport's service area through the year 2020.

The primary objective of a forecasting effort is to define the magnitude of change that can be expected over time. Because of the cyclical nature of the economy, it is virtually impossible to predict with certainty aviation activity

on a year-to-year basis over an extended period of time. A growth curve can be established, however, to predict the overall long-term growth potential.

While a single line is often used to express the anticipated growth, it is important to remember that actual growth may fluctuate above and below this line; actual growth in activity seldom follows a simple straight line or mathematical curve.

It is also important to recognize that forecasts serve only as guidelines, and planning must remain flexible to respond to unforeseen events. Aviation activity at an airport is influenced by many external factors, as well as by the facilities and services available. Since

its inception, few industries have seen as dramatic a change as the aviation industry. Major technological advancements, regulatory and economic actions, and artificial infusions of pilots as a result of armed conflict, have resulted in erratic growth patterns placing significant impacts upon aviation activity.

The following sections attempt to define historical aviation trends and discuss other influences which may affect the future use of Ernest A. Love Field. The results of these analyses are presented as the "best estimate" or selected forecasts for the facility.

In addition, it must be realized that the forecasts presented in this chapter are "unconstrained" in nature. Any existing physical or policy constraints at Ernest A. Love Field will not be taken into consideration during the development of these forecast numbers. Chapter Four, Development Alternatives, will begin to address any physical and policy constraints and will identify a "constrained" aviation forecast, if necessary.

FORECASTING METHODOLOGY

The systematic development of aviation forecasts involves both analytical and judgmental processes. A series of mathematical relationships are tested to establish statistical logic and rationale for projected growth. The judgement of the forecast analyst, based upon professional experience and knowledge of the situation, is important

to the final determination of the selected forecast.

The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include: trendline projection, correlation analysis, regression analysis, and market share analysis.

The analysis begins with the assessment of historical trends as data is collected and sorted on a variety of aviation indicators at the local, regional, and national level. Data on aviation related factors such as aircraft operations, based and registered aircraft, passenger enplanements and fuel sales were obtained for the analyses. Similarly, socioeconomic factors such as population, income, and employment are also analyzed for their effect on aviation activity. The identification and comparison of the relationships between these various indicators provides the initial step in the development of realistic forecasts of aviation demand.

Trendline projection is probably the simplest and most familiar of the forecasting techniques. By fitting classical growth curves to historical demand data, then extending them into the future, a basic trendline projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a

reliable benchmark for comparing other projections. It is also important to remember that this methodology is time sensitive and only as accurate as the data points entered into the formula.

Correlation analysis provides a measure of direct relationship between two separate sets of historical data. An analysis is run which determines whether a change in one data base has historically reflected a corresponding change in the other data base. Should a reasonable correlation between the two data sets be determined, a regression analysis would then be employed to forecast future changes to one of the data bases. The relationship between two data bases is considered to be reliable when the resulting correlation coefficient (Pearson's "R²") value is close to 1.0. The R² value can be considered the relationship value: the higher the number, the stronger the correlation between the data bases, the lower the number, the weaker the relationship. Low R² values mean that the two data bases are not related and that changes in one data base are not reflected by changes in the other data base. Forecasters prefer to see R² values of greater than 0.95; however, lower numbers can be used recognizing that correlation and, therefore, reliability is not as strong.

In *regression analysis*, values for the aviation demand element such as based aircraft, operations, etc., (the dependent variable) are projected on the basis of one or more of the other indicators such as population, per capita income, etc., (the independent variables). Historical values for all variables are analyzed to

determine the relationship between the independent and dependent variables. These relationships may be used, with projected values of the independent variable(s), to project corresponding values of the dependent variable.

Market share analysis involves an historical review of the activity at an airport or airport system as a percentage share of a larger statewide or national aviation market. A trend analysis of this historical share of the market is followed by projecting a future market share. These shares are then multiplied by forecasts of the activity within the larger geographical area to produce a market share projection. This method has the same limitations as a trendline projection, but can provide a useful check on the validity of other forecasting techniques.

In addition, another "cross-check" technique is to review and consider the forecasts made by other agencies. Although these agencies often utilize different data bases and variables, they generally use the same general techniques for forecasting aviation activity. This review of other forecasting efforts, can assist in making subjective judgments concerning short term forecast trends.

Using a broad spectrum of local, regional, and national socioeconomic information, surveys and aviation trends, forecasts were developed for several key aviation activity categories, including the following.

- General Aviation Based Aircraft
- Based Aircraft Fleet Mix

- General Aviation Aircraft Operations
- Passenger Enplanements
- Commercial Service Operations
- Air Taxi Operations
- Annual Instrument Approaches
- Peaking Characteristics

The forecasting process also considers various other growth elements and several intangible factors before determining the selected forecast. These additional factors include the following.

- Uses for which the forecast is being developed
- Character of the community and service area
- Potential changes in the general business environment
- State-of-the-art advances in aviation related technology
- Impact of new facilities or improved services
- Policies of the airport owner and operator

For planning purposes, two important considerations impact the finalized forecasts. First, due to both economic and technological changes, one cannot assume a high level of confidence in forecasts that extend beyond five years; however, more than five years is often needed to complete a facilities development program, and at least twenty years is necessary to adequately amortize most capital improvements. The second consideration is the level of optimism reflected in the forecasts; aviation forecasting typically indicates some growth in the use of the facility, regardless of recent historical activity.

This allows for comprehensive planning of the airport facility. To counter this unrestricted growth, the planning efforts to follow (e.g. Facility Requirements) must incorporate a degree of flexibility that will be responsive to deviations from the selected forecasts (e.g. timing of facility improvement and upgrades).

TRENDS AT THE NATIONAL LEVEL

Each year, the Federal Aviation Administration (FAA) publishes its national aviation forecast. Included in this publication are forecasts for air carriers, air taxi/commuters, general aviation and military activity. The forecasts are prepared to meet budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and by the general public. The current edition when this chapter was prepared was *FAA Aviation Forecasts-Fiscal Years 1996-2007*. The forecast uses the economic performance of the United States as an indicator of future aviation industry growth in this country. Similar economic analyses are applied to the outlook for aviation growth in international markets.

For the U.S. aviation industry, the outlook for the next twelve years is for moderate to strong economic growth, moderately increasing fuel prices, and moderate inflation. Based on these assumptions, aviation activity by fiscal year 2007 is forecast to increase by 19.5

percent at towered airports and 26.8 percent at air route traffic control centers. The general aviation active fleet is projected to decline for the next few years then begin to rebound for a net increase of 4.9 percent. General aviation hours flown are forecast to increase by 9.9 percent during this same time period. Scheduled domestic revenue passenger miles (RPMs) are forecast to increase 57.3 percent, with scheduled international RPMs forecast to increase by 84.8 percent through 2007. Regional/commuter RPMs are forecast to increase by 116.7 percent through the year 2007.

COMMERCIAL AIRLINES

After several consecutive years of little or no passenger growth, the commercial aviation industry in the United States experienced substantial growth in 1994 and 1995. Passenger enplanements that had averaged only 1.5 percent annual growth the previous four years grew by 8.2 percent in 1994 and 5.0 percent in 1995. This growth was attributed in part to strong U.S. economic growth and to the restructuring taking place in the industry.

As a result, the financial performance of the airline industry as a whole has improved considerably in the last two years. After four years of operating losses totaling nearly \$5.0 billion, 1994 and 1995 showed operating profits of nearly \$8.0 billion. Although the industry as a whole showed a profit, there was a wide range of profits and losses among the individual carriers. In

fact, several carriers remained risks for bankruptcy or liquidation.

Restructuring is still a priority among the larger, older carriers. This has included delaying the delivery of new aircraft, route realignment, service reduction or withdrawal from unprofitable markets, turning over short haul routes to code-sharing commuters, and reducing jobs and salaries. The goal of this restructuring appears to be to reduce costs per seat mile to be competitive with the lower cost airlines.

Also contributing to the pressure for lowering costs is the continuing wave of new entrant carriers. The new carriers have been spurred by the availability of inexpensive aircraft and the success of several low-cost airlines. The continued availability of venture capital will play an important part in new entries into the market.

Another factor influencing the airline industry is the spread of employee ownership in majority interest in the major carriers. With the changes in incentive and employee outlook expected, employee ownership appears to be a positive step for the basic goal of lowering the cost structure of larger carriers.

The airline industry is also expected to continue toward globalization. The United States has been trying to create a more competitive international environment for its airlines through the development of multi-national agreements. If agreements can be reached for a more open system, it is

expected that the more efficient U.S. airlines could experience higher growth than what is now projected.

The commuter airline industry continues to be the fastest growing sector of aviation in the 1990's. Commuter passengers in the U.S. have increased 75 percent in the 1990's. Much of this growth can be attributed to the restructuring of the major airlines. However, the recent rebound of the major airlines may be affecting the commuter airlines as 1995 commuter enplanements were up less than one percent.

The commuter fleet has continued to be upgraded to include larger turboprop aircraft. Several commuter airlines are now operating 50 to 75 seat regional jets. The use of these aircraft is expected to lead to greater acceptance of the commuter airlines by the traveling public.

The FAA projections for domestic and international commercial service passenger enplanements indicate relatively strong growth. Domestic enplanements are projected to grow at an average annual rate of approximately 3.7 percent through the year 2007. International enplanements are projected to grow at an annual average rate of 5.3 percent during the same period.

REGIONAL/COMMUTER AIRLINES

Traffic growth in 1995 was impacted by several factors affecting a number of the

largest regional operators. They include the temporary grounding of the ATR aircraft, which significantly reduced capacity in the second quarter of FY 1995, changes in hubbing operations by several major carriers (American Eagle operations at Nashville and Raleigh-Durham, Delta Connection at Dallas, and Continental Express at Denver), and the competitive impact of the United Shuttle on the West Coast.

In the future, industry growth is expected to out-pace that of the larger commercial air carriers and to be driven by the increased demand for aviation services. The introduction of new state-of-the-art aircraft, especially large high-speed turboprops and regional jets with ranges of up to 1,000 miles, opens up new opportunities for growth in nontraditional markets. However, the role of the regional airline industry will remain that of feeding traffic to the major and national carriers even as they expand into markets with longer route segments.

The FAA is anticipating that the future rate of growth in enplanements will be lower than that experienced in the past. A factor contributing to the anticipated slower growth rate is that the larger commercial carriers are operating at relatively high load factors which tends to diminish the value of additional feeder traffic. Until the major and national carriers begin to add fleet capacity, they will not require significant increases in feeder traffic from the regional partners. FAA's projection of regional/commuter enplanements is reflected in **Exhibit**

2A, U.S. Regional/Commuter Forecasts.

Revenue passenger miles are expected to increase at a faster rate than enplanements because the regional airlines are moving into larger aircraft having longer ranges. This will open up additional markets for the regional/commuter operators. Thus the average passenger trip length is expected to increase during the forecast period, but the regional/commuter carriers will continue to serve primarily shorter-haul markets. The emphasis will be on improved service quality and schedule frequency in the markets best suited to their operations.

It is also expected that the regional/commuter aircraft fleet will continue to grow during the forecast period. The average seats per aircraft is expected to increase by almost 50 percent over the FAA's 12-year forecast period (3.4 percent annually), from 23.7 in 1995 to 35.3 in 2007. The most significant change in the fleet composition will result from the introduction of regional jet aircraft, many of which fall into the "40 to 60 seat" category. These aircraft will contribute to increased public acceptance of regional airline service, and will offer greater potential for replacement service on selected jet routes. The greatest growth in the fleet is expected to occur in the "20 to 40 seats" and "greater than 40 seats" categories, as reflected on **Exhibit 2A**. This is due to the continued substitution of service and new route opportunities created through the use of larger, longer range regional aircraft.

The average passenger trip length in the 48 contiguous states is projected to increase from 216.6 miles in 1995 to 259.0 miles in 2007. The growth in the average passenger trip length and resulting growth in RPMs will be driven, in large part, by the increased introduction of larger high-speed turboprop and regional jet aircraft.

GENERAL AVIATION

The general aviation industry is an important contributor to the nation's economy. General aviation (GA) includes the production and sale of aircraft, avionics and other equipment, along with the provision of support services such as flight schools, fixed base operators, finance and insurance. The single engine piston aircraft market is the base on which GA activity builds. New pilots are trained in single engine piston aircraft and work their way up through retractable landing gear, multi-engine aircraft to turbine aircraft. When the single engine piston market declines, it signals the slowing of expansion in the GA fleet and, consequently, a slowing in the rate of growth of activity at airports.

Since 1978 there has been a dramatic decline in shipments of all types of GA aircraft. In fiscal year 1988, the number of new aircraft shipments totaled 1,143. In 1989, they increased to 1,535, but fell again to 1,144 in 1990 and continued to fall to only 876 units in 1994. In 1995, shipments were up 12.9 percent to 980. Most important was the fact that this increase occurred

across all aircraft types, including single engine piston. Billings for general aviation aircraft were up for the third consecutive year.

A number of events have factored into the extended decline in the general aviation industry. These have included the deregulation of the airline industry, increases in airspace restrictions for Visual Flight Rule (VFR) only aircraft, reductions in leisure time, and shifts in personal preferences for goods, services, and leisure time. The overriding factor, however, has been the increased cost in owning and operating a general aviation aircraft.

There are a number of reasons, however, to maintain a favorable outlook for the future of general aviation. One of the primary reasons is the passage of the **General Aviation Revitalization Act of 1994**. This legislation limits the liability on general aviation aircraft to 18 years from the date of manufacture. This has sparked an interest to renew the manufacturing of general aviation aircraft due to the reduction in product liability. The high cost of product liability insurance was a major factor in the decisions by many American aircraft manufacturers to slow or discontinue the production of general aviation aircraft.

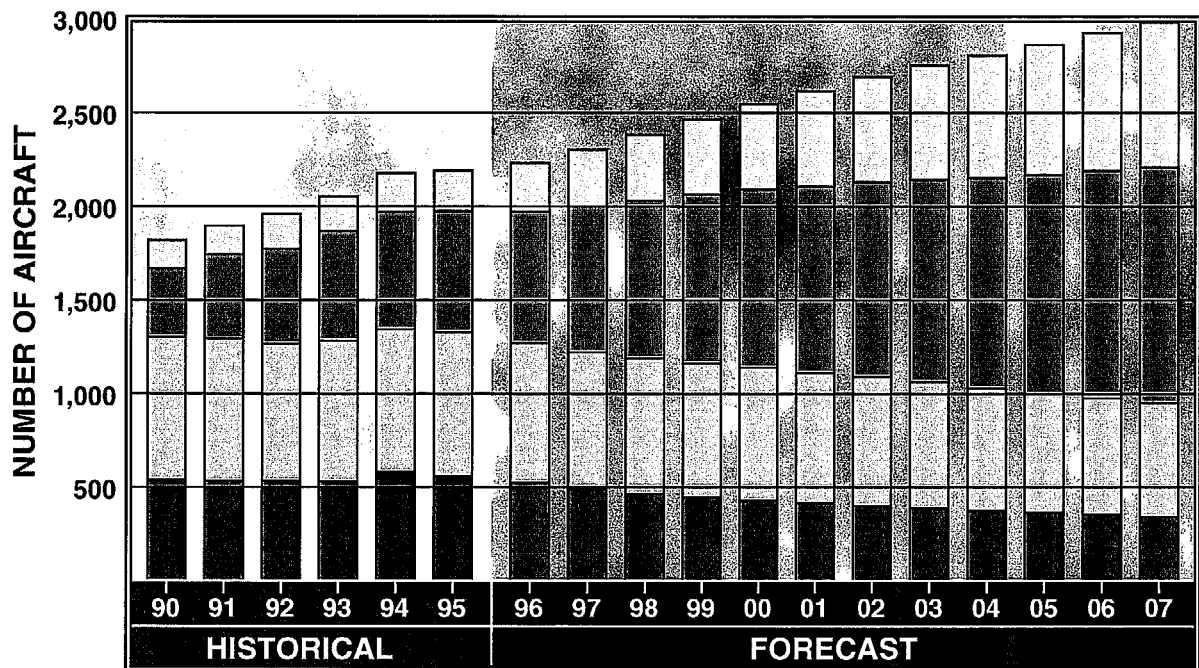
Since the enactment of this legislation, Cessna Aircraft has committed to resume production of single engine aircraft and Piper has announced plans to increase production levels. In addition, the amateur-built aircraft market has shown steady growth over the past several years.

Other reasons for a more favorable long range outlook for general aviation is a growing realization that the industry must "reinvent" itself. As a result, several federal, manufacturer, and industry programs have been initiated. Among these is the FAA's recent streamlining of the small aircraft certification process for new entry-level (Primary Category Rule) that could encourage the production of small, affordable aircraft.

Eleven general aviation organizations have formed a coalition in support of the implementation of the FAA's General Aviation Action Plan. This Action Plan has goals to seek to provide for regulatory relief and reduced user costs, improved delivery of services through reduced layers of management and more communication, elimination of unneeded programs and processes, and encouragement of product innovation and competitiveness.

Manufacturer and industry programs include the "No Plane, No Gain" program promoted jointly by the General Aviation Manufacturers Association (GAMA) and the National Business Aircraft Association (NBAA). This program is designed to promote the use of general aviation aircraft as an essential tool for business. Other programs are intended to promote growth in new pilot starts and to introduce people to general aviation. These include the Aircraft Owner's and Pilots Association's (AOPA) "Pilot Project", the National Air Transportation Association's (NATA) "Learn to Fly" program, and the Experimental

PASSENGER AIRCRAFT

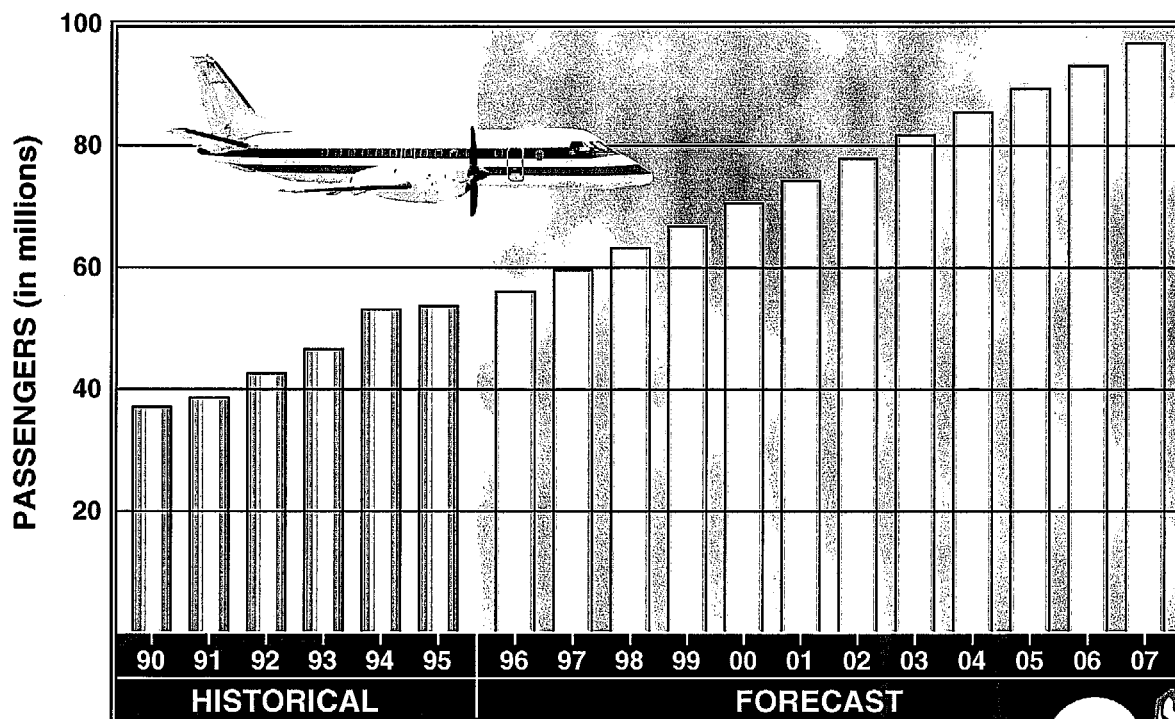


LEGEND



Source: Fleet, FAA Aircraft Utilization and Propulsion Reliability Report

SCHEDULED PASSENGER ENPLANEMENTS



Source: BTS, Form's 298-C and 41



Aircraft Association's (EAA) "Young Eagles" program.

FAA forecasts future GA active aircraft to continue to decline for the short-term, followed by slow growth. An aging general aviation fleet is the primary reason for the short term decline in active aircraft. The average age of the fleet is 27 years with piston aircraft accounting for most of the aging aircraft. **Exhibit 2B, U.S. Active General Aviation Aircraft Forecast**, depicts the FAA forecast for active GA aircraft in the United States. Piston aircraft are anticipated to have a net increase of 3,300 units in the active fleet by 2007. The turboprop and jet aircraft fleets will continue to grow, adding 1,600 aircraft for a 1.5 percent average annual growth rate in the turbine fleet.

OTHER AVIATION STUDIES

In order to develop aviation forecasts for Ernest A. Love Field, other aviation related documents were reviewed. Each of the following studies provides an insight to the anticipated levels of various aviation related activities. Each of these studies are briefly summarized in the following sections.

1986 AIRPORT MASTER PLAN

The last airport master plan completed for Ernest A. Love Field was conducted in 1986. As was stated earlier, the aviation industry has evolved through many changes since this document was prepared; however, the projected

aviation activities are described in the following paragraph.

The operations at Ernest A. Love Field were anticipated to reach 346,400 annual operation by the year 2005. The forecast of based aircraft was determined to be 382 by 2005. The forecast number of passenger enplanements was anticipated to reach 22,200 by the year 2005. These forecasts indicating 3.9 percent, 3.7 percent, and 5.1 percent average annual growth rates, respectively.

The Master Plan identified a number of improvements that would be needed to meet this anticipated growth. The project of greatest importance was the construction of a parallel runway in order to enhance the airport's capacity. This runway was since constructed in 1991.

1990 ENVIRONMENTAL ASSESSMENT

In 1990, an Environmental Assessment was conducted to examine the proposed parallel runway construction. In conjunction with the Environmental Assessment, an update to the 1986 Master Plan forecast was conducted. The update forecast indicated that anticipated annual operations would reach 475,000 by the year 2000. In addition, based aircraft were forecast to reach 365 and passenger enplanements 14,200 by the year 2000. These three forecasts indicate 4.4 percent, 4.2 percent, and 3.4 percent average annual growth rates, respectively.

1995 ARIZONA STATE NEEDS STUDY

The Arizona Department of Transportation, Aeronautics Division, evaluated the existing status, condition, and performance of Arizona's aviation system. Within the 1995 Arizona State Needs Study, Ernest A. Love Field was projected to have approximately 450,993 annual aircraft operations in the year 2015. In addition, based aircraft were anticipated to reach 357, while passenger enplanements were projected to be 20,000 by the 2015. These forecast represent an annual average growth rate of 2.2 percent, 2.2 percent, and 5.4 percent, respectively.

POPULATION TRENDS AND FORECASTS

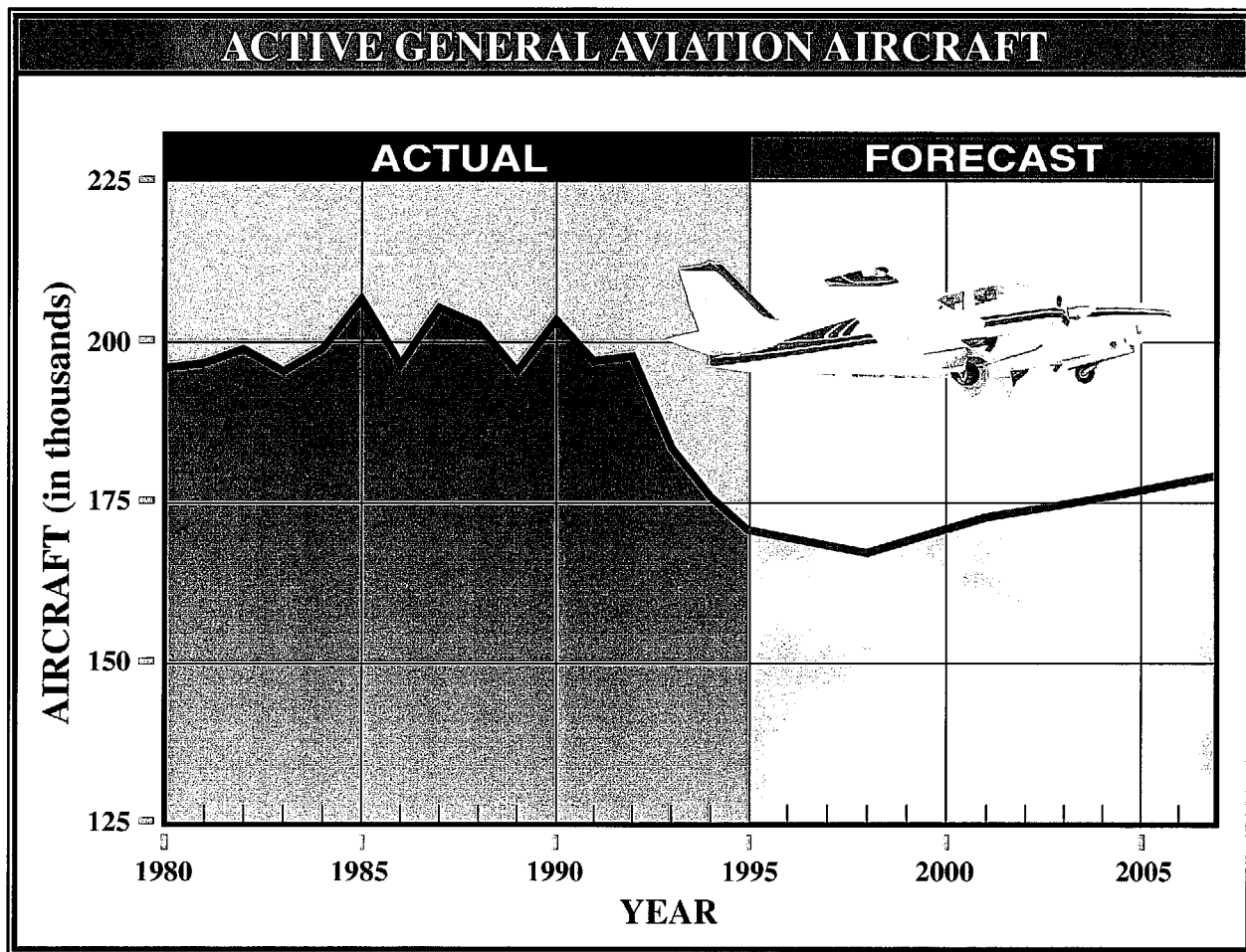
Historical as well as forecast population data normally provide a good indication of future aviation demand at an airport. Since previous population growth of a community or service area can be tracked, past growth trends can then be correlated to airport activity. A service

area growth rate in population will normally produce a demand for airport services. Conversely, a service area with little growth or a net population decrease will generally not produce an increased demand for airport services.

To determine the aviation demand for Ernest A. Love Field, the role of the airport and the geographic extent of the area the airport serves was identified. The *Airport Service Area* of an airport is defined by its proximity to other airports providing similar service to the public, rather than by any jurisdictional boundaries. Ernest A. Love Field is located in central Arizona, therefore, for the purposes of this study the airport service area was generally defined as the population centers of the communities of the City of Prescott, Town of Prescott Valley and the Town of Chino Valley. It is anticipated that the airport will continue to serve the needs of the residents in these areas.

Table 2A, Forecast Population Growth, indicates the population forecast for those areas through the year 2020.

TABLE 2A Forecast Population Growth					
Region	2000	2005	2010	2015	2020
State of Arizona	4,709,225	5,132,725	5,715,450	6,248,125	6,802,875
Yavapai County	147,675	160,125	187,400	206,425	225,650
City of Prescott	32,636	36,132	39,975	48,815	47,724
Town of Prescott Valley	15,874	19,843	24,205	28,750	33,001
Town of Chino Valley	6,674	7,714	8,856	9,305	11,160
Airport Service Area	88,074	111,217	139,021	173,779	217,221
Note: Airport Service Area includes the forecast populations for the City of Prescott, the Town of Prescott Valley, and the Town of Chino Valley.					
Source: Arizona Department of Economic Security Population Statistics Unit, Approved May 1993; Central Yavapai County Transportation Study, October 1995 and surrounding areas as projected in the Central Yavapai County Transportation Study. 2020 forecast extrapolated by Coffman Associates.					



U.S. ACTIVE GENERAL AVIATION AIRCRAFT (in thousands)									
As of January 1	FIXED WING				ROTORCRAFT				
	PISTON		TURBINE		ROTORCRAFT		Experimental	Other	Total
	Single Engine	Multi- Engine	Turboprop	Turbojet	Piston	Turbine			
1995	123.3	15.6	4.2	4.1	1.4	3.0	12.9	6.2	170.6
1998	119.0	15.1	4.4	4.3	1.3	3.0	13.5	6.7	167.3
2001	122.6	15.5	4.6	4.5	1.2	3.0	14.1	7.0	172.5
2004	124.5	15.6	4.8	4.7	1.1	3.0	14.6	7.4	175.7
2007	126.4	15.8	5.0	4.9	1.1	3.0	15.0	7.7	178.9

Source: FAA Aviation Forecasts, Fiscal Years 1996-2007.

Notes: Detail may not add to total because of independent rounding. An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.



GENERAL AVIATION ACTIVITY

General aviation is defined as that portion of aviation activity which encompasses all facets of aviation except commercial airline and military operations and constitutes the majority of aircraft activity at the Ernest A. Love Field. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. These indicators of general aviation demand include the following.

- Based Aircraft
- Aircraft Fleet Mix
- Annual Aircraft Operations

The total number of based aircraft at an airport is one of the most basic indicators of general aviation demand. By first developing a forecast of based aircraft, the growth of general aviation operational levels can be projected in consideration of the forecast based aircraft as well as other factors characteristic to Ernest A. Love Field.

Once again, it is important to remember that the forecasts produced in this chapter are unconstrained forecasts, indicating that no constraints have been placed upon the growth of aviation activity due to physical facility limitations or management policies. These forecasts are based upon the

demand within the service area, population projections, and historical trends. The rationale behind the general aviation activity forecast is presented below.

EMBRY RIDDLE AERONAUTICAL UNIVERSITY

Due to the significant impact of Embry Riddle Aeronautical University (ERAU) on the activity at Ernest A. Love Field, it is necessary to evaluate the ERAU activities separately from the remaining general aviation activity. Based on input from representatives of ERAU, historical ERAU based aircraft data was collected. The following sections discuss ERAU based aircraft and operational levels at Ernest A. Love Field.

ERAU Based Aircraft

Table 2B, Historical ERAU Based Aircraft, presents the historical ERAU based aircraft data over the last ten years. Due to the acquisition and retirement of aircraft during a typical year, ERAU representatives provided the average number of aircraft during the specific year. As shown in **Table 2B**, the number of ERAU based aircraft has grown significantly since 1985. Year-to-year fluctuations are reflective of flight student enrollment.

TABLE 2B Historical ERAU Based Aircraft Ernest A. Love Field	
Year	Based Aircraft
1985	11
1986	11
1987	20
1988	21
1989	37
1990	52
1991	51
1992	41
1993	42
1994	37
1995	40
Source: ERAU Administration	

According to correspondence from ERAU, they estimate that the number of ERAU based aircraft to be approximately 50 by the year 2002. This projection was determined through the use of a linear projection. Beyond that time period, it is anticipated that ERAU based aircraft will remain static throughout the 20-year planning period. **Table 2C, Forecast ERAU Based Aircraft**, indicates the projected number of based aircraft anticipated throughout the planning period.

TABLE 2C Forecast ERAU Based Aircraft Ernest A. Love Field	
Year	Based Aircraft
2000	50
2005	50
2010	50
2015	50
2020	50
Source: ERAU Administration	

ERAU Annual Operations

Based on correspondence from ERAU, in 1995 ERAU annual operations were approximately 250,000 or nearly 70 percent of the total annual operations at Ernest A. Love Field. ERAU estimates that their annual operations at Ernest A. Love Field will not necessarily change. They anticipate that if additional operations (those over 250,000) were to be conducted, they would be redirected to other airports in the area. Based on this information, the annual operations level at Ernest A. Love Field is projected to remain constant at 250,000 throughout the 20-year planning period.

NON-ERAU GENERAL AVIATION BASED AIRCRAFT

The number of non-ERAU based aircraft at Ernest A. Love Field is highly dependent upon the nature and magnitude of aircraft ownership in the general aviation service area. Preparation of based aircraft forecasts were initiated with a review of historical data on aircraft based at the airport, aircraft registered within the FAA's Western-Pacific Region (AWP), and active general aviation aircraft within the United States. Those aircraft related to ERAU were removed from both the historical and forecast data presented in this section.

Historical data related to non-ERAU based aircraft were collected from several sources including FAA records and records kept by the airport sponsor and the fixed base operators. The

average annual growth rate in non-ERAU based aircraft for Ernest A. Love Field during the period of 1985 to 1995 was 2.17 percent; however, over this 10 year period the number of based aircraft ranged from a high of 223 in 1990, to a low of 175 in 1985. The historical based aircraft data for Ernest A. Love Field is presented in **Table 2D, Historical Non-ERAU Based Aircraft.**

TABLE 2D Historical Non-ERAU Based Aircraft Ernest A. Love Field	
Year	Based Aircraft
1985	175
1986	N/A
1987	N/A
1988	N/A
1989	197
1990	223
1991	194
1992	197
1993	199
1994	220
1995	218
Note: N/A - Not Available Source: Ernest A. Love Field Administration	

A trendline analysis of the non-ERAU based aircraft at Ernest A. Love Field for the time period between 1989-1995 resulted in a good correlation coefficient. The correlation coefficient determined was 0.81. This trendline analysis resulted in 392 aircraft in 2020, indicating a 2.4 percent average annual growth rate.

Linear regression analysis was accomplished using population statistics of the Airport Service Area for Ernest A. Love Field. The historical and forecast population for the Airport Service Area and Yavapai County were utilized as the independent variable, while the historical non-ERAU based aircraft was the dependent variable. These regression analyzes resulted in very poor correlations, therefore, were considered to be of no forecasting value.

Market share analysis was also evaluated for Ernest A. Love Field. The historical and forecast active general aviation aircraft in the United States and the AWP Region were compared to the historical non-ERAU based aircraft at Ernest A. Love Field. Based on the percentage of the aircraft based at Ernest A. Love Field to that in the AWP Region, the forecast market share of based aircraft for Ernest A. Love Field was determined. In 1995, the market share was 0.77 percent, the highest over the last ten years. Assuming this constant market share throughout the planning period, the forecast results ranged from 217 in the year 2000 to 240 in 2020. The results of this market share analysis are included in **Table 2E.**

Another method used to determine market share is the ratio of based aircraft per 1,000 population in a specific region. Utilizing the Airport Service Area, historical and forecast population, non-ERAU based aircraft projections were determined. Over the last ten years the non-ERAU based aircraft per 1,000 population ratio has

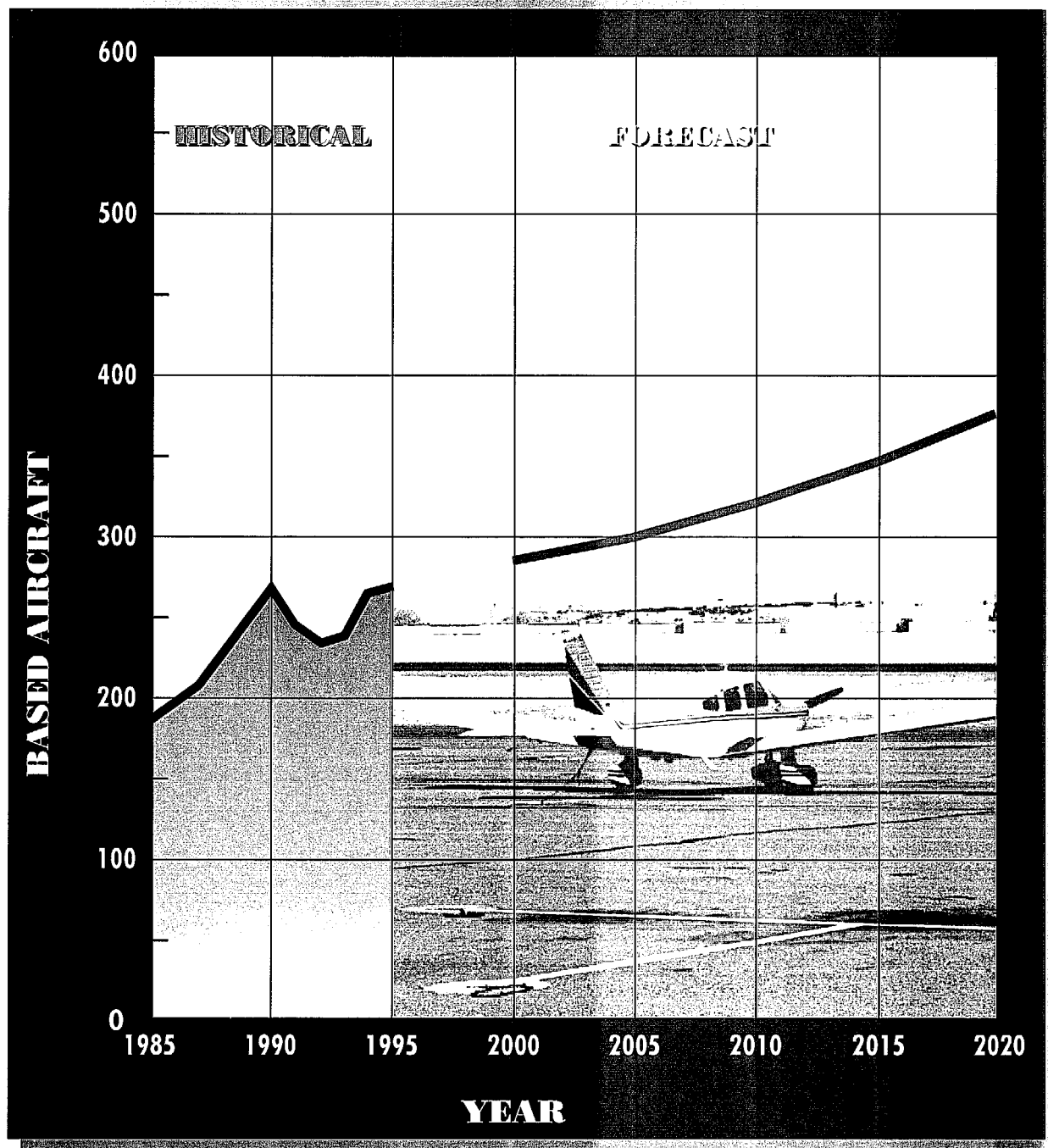
decreased from a high of 5.68 in 1985 to a low of 4.39 in 1995. This trend of based aircraft per 1,000 population decreasing is expected to continue throughout the planning period as the population within the service area increases at a greater growth rate than the number of based aircraft within the same region. It is anticipated that by the year 2020 the ratio will be 3.42. As a result, the projected based aircraft for the year 2020 is estimated to be 339. The results of this market share are included in **Table 2E**.

Forecasts from the *National Plan of Integrated Airport Systems (NPIAS)* was also reviewed. The forecast number of based aircraft in the NPIAS for the year 2000 was 260, indicating a growth of three aircraft in the next five years.

This was considered relatively low, however, is included in **Table 2E**. Those other aviation related studies discussed earlier in this chapter that projected based aircraft numbers are also shown in **Table 2E**.

The selected non-ERAU based aircraft forecast indicated in **Table 2E**, illustrates a 1.6 percent average annual growth rate through the planning period. This growth rate is approximately half that projected in the previous Master Plan and Environmental Assessment, however, is just slightly lower than the recently completed *Arizona State Needs Study* (1.7 percent). **Exhibit 2C, Total Based Aircraft Forecast**, illustrates the combined ERAU and Non-ERAU based aircraft forecasts.

TABLE 2E					
Non-ERAU Based Aircraft Forecast					
Ernest A. Love Field					
	2000	2005	2010	2015	2020
Trendline Analysis					
1989-1995 ($R^2=0.81$)	254	288	323	357	392
Market Share Analysis of					
FAA Western Pacific Region	217	222	228	233	240
Based Aircraft per 1,000 Population					
Service Area	222	250	280	312	339
Other Resources					
1986 Master Plan	309	357	N/A	N/A	N/A
1990 EA ¹	365	N/A	N/A	N/A	N/A
1995-2000 NPIAS ¹	260	N/A	N/A	N/A	N/A
1995 State Needs Study ¹	262	293	326	357	N/A
Selected Forecast					
Non-ERAU Based Aircraft Forecast	230	250	275	300	324
Notes: ¹ includes ERAU based aircraft N/A - Not Available					



AIRCRAFT FLEET MIX

Knowing the aircraft fleet mix expected to utilize the airport is necessary to properly plan the facilities that will best serve not only the level of activity but also the type of activities occurring at the airport. The mix of based aircraft, including ERAU, at Ernest A. Love Field was determined by an analysis of the types of aircraft historically and currently based at the Airport. This was compared with the FAA existing and forecast general aviation fleet mix. The fleet mix at Ernest A. Love Field is anticipated to be similar to that of the national trends, with a trend towards a

slightly higher percentage of more sophisticated and higher performance aircraft in the future. The single engine aircraft percentage is expected to decrease from approximately 87.2 percent to 76.0 percent by the end of the planning period. The multi-engine, turboprop, and turbojet percentage are expected to increase from 12.8 percent multi-engine and 0.0 percent of both turbo prop and jet powered aircraft, to 17.3 percent, 4.1 percent and 1.8 percent, respectively. Rotorcraft mix is also expected to increase from 0.0 percent to 0.8 percent. The existing and forecast fleet mix are shown in **Table 2F, Based Aircraft Fleet Mix Projections.**

TABLE 2F Based Aircraft Fleet Mix Projections (includes ERAU) Ernest A. Love Field						
	Existing	Forecast				
Aircraft	1995	2000	2005	2010	2015	2020
Single Engine	224	236	247	262	272	284
Twin Engine	33	40	46	52	60	66
Turbo Prop	0	2	4	6	10	14
Jet	1	1	1	3	5	7
Rotorcraft	0	1	2	2	3	3
Total	258	280	300	325	350	374

NON-ERAU GENERAL AVIATION OPERATIONS

An aircraft operation is defined as any takeoff or landing performed by an aircraft. There are two types of operations, local and itinerant. A local operation is a takeoff or landing performed by an aircraft that will operate within the local traffic pattern, in sight of the airport, or will execute simulated

approaches or touch-and-go operations. Itinerant operations are all arrivals and departures other than local. Generally, local operations are comprised of training operations and itinerant operations are those aircraft with a specific destination away from or to the airport. Typically, itinerant operations increase with business and industry use of the airport since business aircraft are

used primarily to move people from one location to another.

At Ernest A. Love Field, ERAU activity has a significant effect on the types of operations at the airport. As stated earlier, ERAU provided estimated operational levels for the planning period. In order to evaluate the non-ERAU operational levels, the estimate provided by ERAU of approximately 70 percent of the total operations being ERAU was subtracted from the historical data prior to analysis.

Since Ernest A. Love Field has an Airport Traffic Control Tower (ATCT), actual operations data was utilized. In addition, other historical records were available from the airport records, and the *1995-2010 FAA Terminal Area Forecast*. Since military operations are less than one percent of the annual operation, they will be included in the general aviation operations forecast.

An historical trendline analysis for the period 1985-95 produced a fair correlation with a coefficient of 0.72. This projection of operations using the trendline analysis resulted in an average annual growth rate of 2.8 percent. The results of the trendline analysis are illustrated in **Table 2G, Non-ERAU General Aviation Operations.**

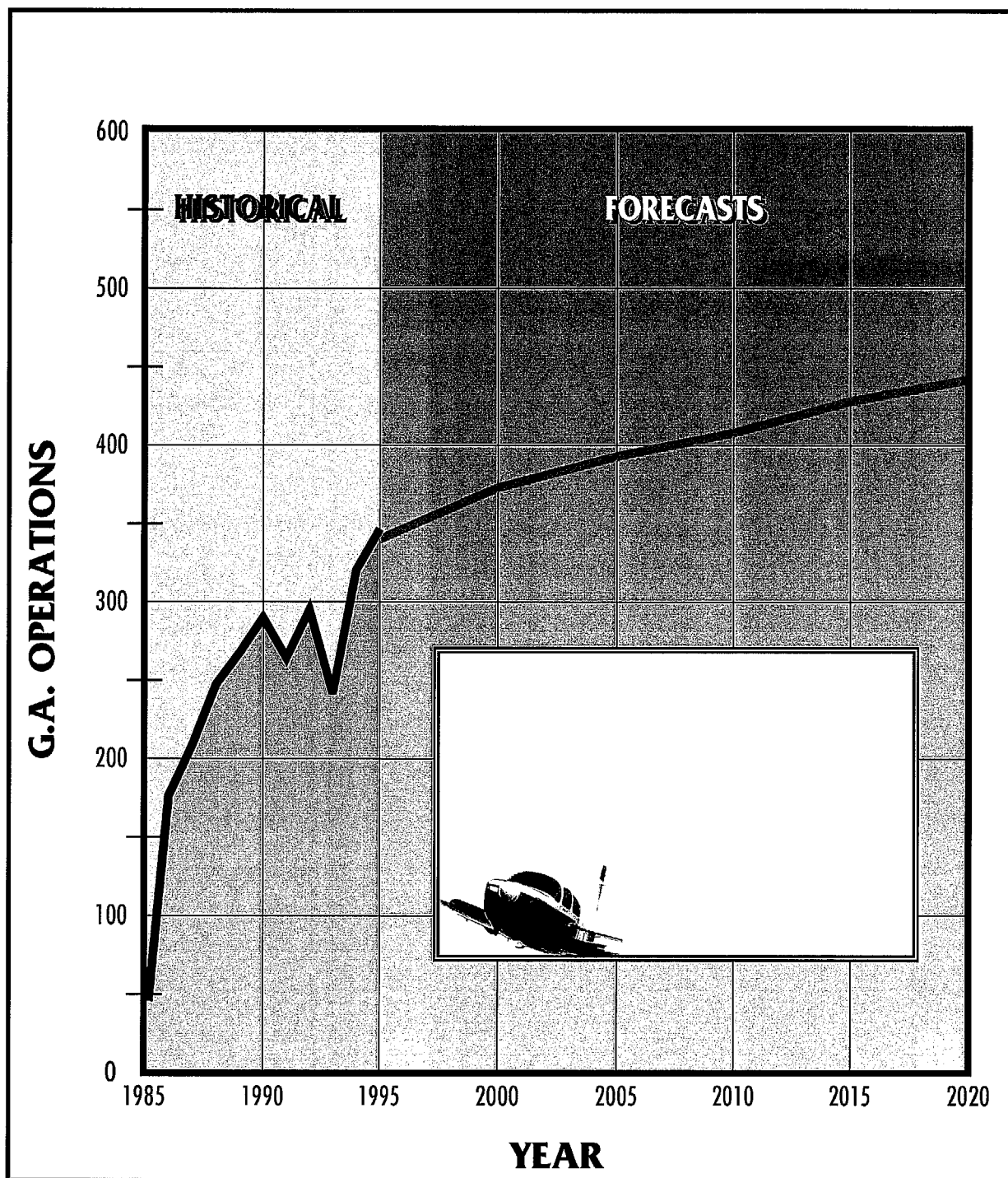
Linear regression analysis of general aviation operations at Ernest A. Love Field was conducted using the population data for the Airport Service Area. This analysis resulted in a fair correlation coefficient of 0.61. The forecast operation results from this analysis resulted in a 2.3 percent

average annual growth rate, which is indicated in **Table 2G.**

Another commonly used forecasting method for projecting general aviation operations is the use of a ratio of operations to based aircraft. Based on the 1989-1995 non-ERAU based aircraft data for Ernest A. Love Field, the average operation per based aircraft was determined to be approximately 398, however, the trend over the same period was increasing. In 1995, the operations per based aircraft was at a high of 479. Assuming the 1995 ratio to remain constant over the planning period, the general aviation operations were forecast for the 20-year period. This forecast illustrates a 2.4 percent average annual growth rate. The results are presented in **Table 2G.**

Also included in **Table 2G** are forecasts of operational levels produced in the *National Plan of Integrated Airport Systems, 1995-2000*, the *1995-2010 FAA Terminal Area Forecast*, and the other aviation related studies discussed earlier in this chapter. Each of these studies did not breakout the ERAU based aircraft, however, have been included for reference.

The selected forecast of general aviation activity is predicated on a 2.5 percent average annual growth rate from the 1995 total of approximately 104,000 to 192,000 by the end of the planning period, as shown on **Table 2G.** Operational activity will continue to be affected by the high cost of purchasing and operating general aviation aircraft. The combined forecast of ERAU and Non-ERAU operations is graphically illustrated on **Exhibit 2D, Total General Aviation Operations.**



LEGEND:



-  Historical
-  Total ERAU and NON-ERAU Operations



TABLE 2G
Non-ERAU General Aviation Operations
Ernest A. Love Field

	2000	2005	2010	2015	2020
Trendline Analysis					
1986-1995 ($R^2=0.72$)	120,106	141,334	162,561	183,789	205,016
Linear Regression Analyses					
Yavapai County Population ($R^2=0.61$)	115,395	N/A	150,685	N/A	184,665
Operations Per Based Aircraft					
Ops/BA (398)	133,162	145,137	159,507	173,877	187,768
Other Resources					
1986 Master Plan	162,200	196,400	N/A	N/A	N/A
1990 EA	475,000	N/A	N/A	N/A	N/A
1995-2000 NPIAS ¹	303,000	N/A	N/A	N/A	N/A
1995-2010 TAF ¹	310,752	319,817	332,406	N/A	N/A
1995 State Needs Study ¹	330,980	370,142	411,831	450,993	N/A
Selected Forecast					
Annual Non-ERAU Operations	123,000	143,000	158,000	178,000	192,000
Notes: ¹ Includes ERAU operations N/A - Not Available					

LOCAL VERSUS ITINERANT OPERATIONAL SPLIT

As previously stated, there are two types of operations; local and itinerant. The split between these two types of operations can provide important insight to the types of facilities needed at the airport (i.e. tiedowns, hangars, navigational aids, etc).

According to the ATCT logs, the general aviation operational split at Ernest A.

Love Field in 1995 was approximately 68 percent local and 32 percent itinerant. Due to the influence of ERAU, it is anticipated that the current percentage of local operations would remain relatively constant through the end of the planning period.

The distribution of local versus itinerant operations for the planning period is illustrated in **Table 2H, General Aviation Local Versus Itinerant Splits.**

TABLE 2H
General Aviation Local Versus Itinerant Splits
Ernest A. Love Field

Operations	Existing	Forecast				
	1995	2000	2005	2010	2015	2020
GA Itinerant	35,975	39,360	45,760	50,560	56,960	61,440
ERAU Itinerant	75,000	75,000	75,000	75,000	75,000	75,000
GA Local	54,306	83,640	97,240	107,440	121,040	130,560
ERAU Local	175,000	175,000	175,000	175,000	175,000	175,000
Total GA Operations	340,281	373,000	393,000	408,000	428,000	442,000

COMMERCIAL SERVICE FORECAST

Airline activity into Ernest A. Love Field is provided by regional/commuter airlines. At the present time, the airport is being served by America West Express, operated by Mesa Airlines. American West Express operates 19 passenger Beech 1900 aircraft.

In order to determine the type and size of facilities necessary to accommodate airline activity at any airport, several elements of this activity must be forecast. The two elements considered most important include *Annual Enplaned Passengers* and *Annual Commercial Service Operations*.

ANNUAL ENPLANED PASSENGERS

Enplaned passengers are those that board a commercial service aircraft for departure from the airport. This statistic is the most basic indicator of demand for airline activity.

The 1995 origin-destination data for Ernest A. Love Field was used to evaluate the top 20 markets. The top 20 markets for Ernest A. Love Field are presented in **Table 2J, Origin-Destination Data**. The data was comprised from a 10 percent passenger sampling of those passengers originating or final destination was Ernest A. Love Field. Currently, the commuter airline serving Ernest A. Love Field only operate to and from Phoenix Sky Harbor International Airport (PHX). PHX is not one of the top 20 origins/destinations, thus indicating that airline activity to and from Prescott is used to connect or feed airlines in Phoenix. It would appear that destinations other than Phoenix could potentially generate a demand for direct service from Ernest A. Love Field. Eight of the top 20 origins/destinations from Prescott are locations which could be served with commuter type aircraft from Ernest A. Love Field. Six of the eight locations are located in Southern California, while the remaining two are Albuquerque, New Mexico and Las Vegas, Nevada. These eight location comprise approximately 49 percent of the total passenger origins and destinations from Prescott.

TABLE 2J
Origin-Destination Data
Ernest A. Love Field

Ranking/Destination	Passengers	% of Total Passengers
1. Los Angeles	113	13.00
2. San Diego	69	7.94
3. San Jose	56	6.44
4. Ontario	54	6.21
5. Burbank	49	5.64
6. Santa Ana	48	5.52
7. Las Vegas	37	4.26
8. San Francisco	36	4.14
9. Oakland	35	4.03
10. Long Beach	33	3.80
11. Denver	28	3.22
12. John F. Kennedy, NY	28	3.22
13. Seattle	28	3.22
14. Albuquerque	23	2.65
15. Sacramento	23	2.65
16. Dallas/Ft. Worth	20	2.30
17. Portland	20	2.30
18. Orlando	19	2.19
19. Reno	17	1.96
20. Kansas City, MO	15	1.73

Note: 10 percent sampling of the 1995 passenger data
Source: USDOT; BACK Information Services

To develop new enplanement forecasts, several of the analytical techniques outlined previously were examined for their applicability. These include historical trend analyses, regression analyses, market share analyses, and a review of other sources.

A trendline forecast based upon historical enplanement data between 1991-1994 produced a very good correlation ($R^2=0.90$), which was expected considering the relatively steady increase in enplanements during this time period. Only using three years of data, however, may not accurately represent a true correlation. An analysis of enplanements between 1987-1995 resulted in a poor correlation

($R^2=0.42$). The forecasts resulting from these trendline analyzes are provided in **Table 2K, Forecast Enplanements**.

Another method used to project enplanement levels at Ernest A. Love Field was the airport's market share of the State's total enplanements. In 1995, Ernest A. Love Field constituted approximately 0.09 percent of the State's total enplanement level. This level has decreased slightly over the last ten years from approximately 0.11 percent in 1985. For planning purposes, however, the 0.09 market share percentage was anticipated to remain constant throughout the planning period. The results from this analysis are provided in **Table 2K**.

One of the more common forecasting practices involves linear regression analysis with population as the independent variable. The 1991-1993 Yavapai County population was analyzed in an attempt to obtain high correlation upon which to make future projections. The correlations proved to be excellent, and the resulting forecast is indicated in **Table 2K**. As stated earlier, however, using a limited amount of data (i.e., number of years) may not accurately indicate a true correlation.

Enplanement forecasts from the *1995-2010 FAA Terminal Area Forecast*, was also examined. The results of this study project enplanement levels through the year 2010. The results from this forecast are included in **Table 2K**.

The selected enplanement forecast indicated in **Table 2K** is predicated on a 5.6 percent average annual growth rate from the 1995 total of 10,256 to 40,000 in the year 2020. This annual growth rate is due to the anticipated population growth of the Airport Service Area. **Exhibit 2E, Enplanements**, illustrates the selected forecast,

however, as stated earlier one should not assume a high level of confidence in those forecasts developed beyond the first five years due to the impacts of outside forces on the airline industry (e.g. economy, political changes, changes in technology, etc.).

Both the national economy and airline industry will be major factors that influence the enplanement forecast. Although the national, state and local economies are slowly recovering from the recession in the late 1980's, the airline industry is struggling and dramatic changes in the airline structure may occur in the future. The factors that affect airline operations will directly impact enplanement forecasts. It is important to note, however, that the most stable portion of the airline industry has occurred in the regional/commuter air carrier segment, an airline segment which serves Ernest A. Love Field. With continued improvement in the economy and balance within the airline industry, enplanement growth at the Ernest A. Love Field should be expected to continue through the planning period.

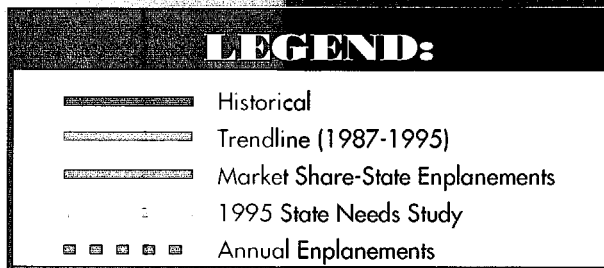
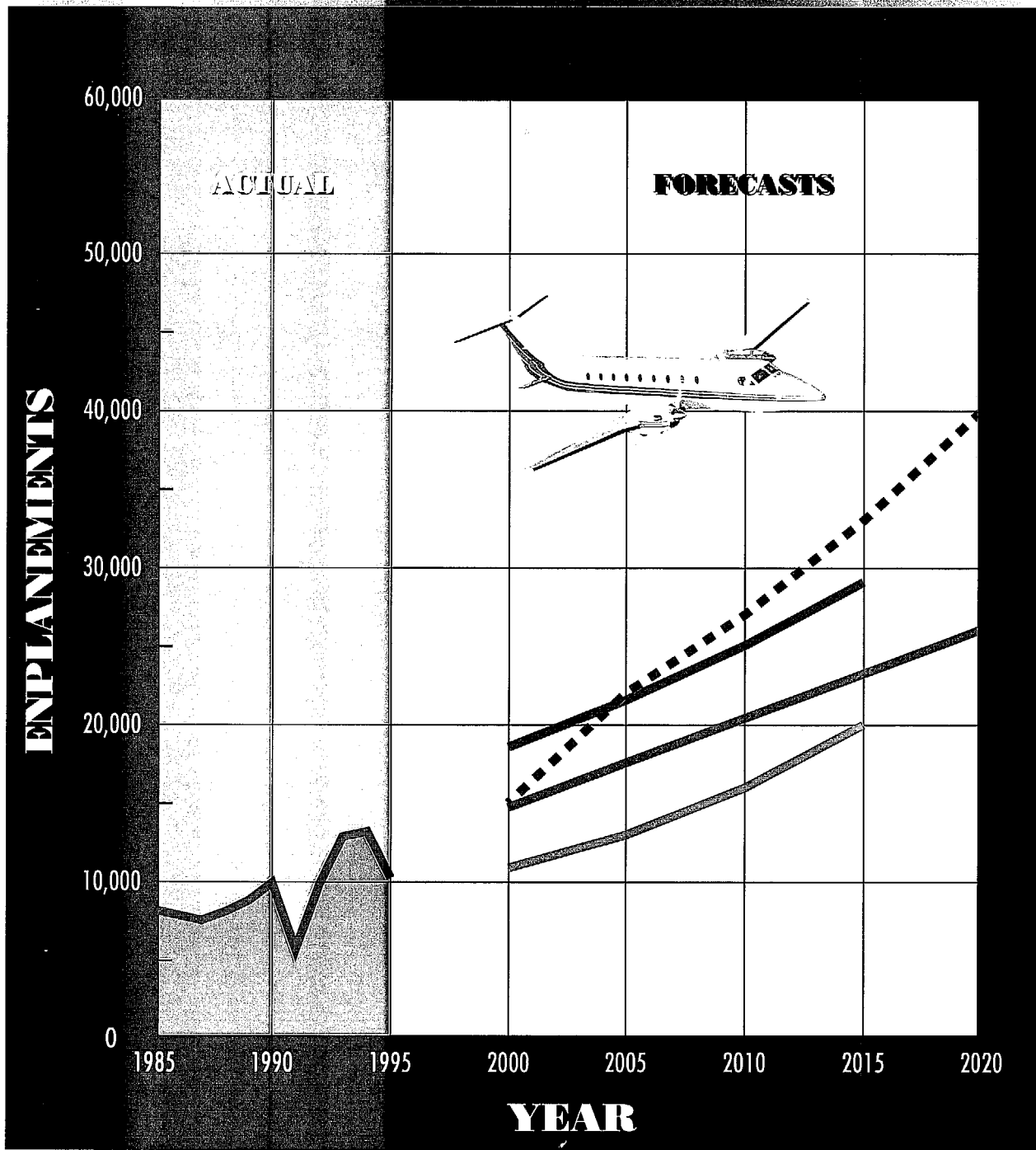


TABLE 2K
Forecast Enplanements
Ernest A. Love Field

	2000	2005	2010	2015	2020
Trendline Analysis					
1987-1995 ($R^2=0.42$)	14,711	17,552	20,393	23,235	26,076
Market Share					
State Enplanements (0.09%)	18,584	21,573	25,055	29,087	N/A
Other Studies					
1986 Master Plan	17,100	22,200	N/A	N/A	N/A
1990 EA	14,200	N/A	N/A	N/A	N/A
1995-2000 NPIAS	8,000	N/A	N/A	N/A	N/A
1995 State Needs Study	10,903	13,000	16,000	20,000	N/A
1995-2010 TAF	21,092	28,312	36,497	N/A	N/A
Selected Forecast					
Annual Enplanements	15,000	22,000	27,000	33,000	40,000
Notes: N/A - Not Available					

ANNUAL COMMERCIAL SERVICE OPERATIONS AND FLEET MIX

In addition to passenger enplanements, there are other factors which affect forecasts of airline facilities. The number of airline operations can be determined from the average ratio of passenger enplanements per departure. This ratio is dependent upon the size of the aircraft and the average percentage of seats that are filled for each departure. The percentage of enplanements to available seats is called the *Boarding Load Factor* (BLF).

The BLF is important to airline companies because it serves as a measure of airline profit from a given market. When the BLF is high, an airline will often consider increasing the number of seats or the number of flights available. The BLF, the type of aircraft and the number of aircraft available,

determine an airline's marketing strategy.

According to the *FAA Aviation Forecasts, 1996-2007*, between 1996 and 2007, the average number of seats per aircraft for regional/commuter airlines in the United States is forecast to be between 23.7 and 35.3, with an average BLF between 48.7 and 49.8 percent. This would result in an average 6.6 percent growth in annual enplanements by regional/commuter airlines in the United States. The BLF for Ernest A. Love Field has historically been lower than the national average and has been projected to increase from 23.5 percent to 33.0 percent during the planning period. **Table 2L, Commercial Airline Fleet Mix and Operations**, depicts the anticipated airline operations based on various seating capacities of commercial aircraft. **Exhibit 2F, Operations Forecast**

Summary, presented at the end of the chapter illustrates the projected

commercial service operations throughout the planning period.

TABLE 2L
Commercial Airline Fleet Mix and Operations
Ernest A. Love Field

	Existing	FORECAST				
	1995	2000	2005	2010	2015	2020
Seating Capacities						
<19 (Single or Small Twins)	0%	0%	0%	0%	0%	0%
=19 (Jetstream, Beech 1900)	100%	100%	100%	98%	97%	95%
=30 (Brasilia)	0%	0%	0%	2%	3%	5%
=70 (Regional Jet)	0%	0%	0%	0%	0%	0%
≥71 (Commercial Jets)	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%
Average Seats, Enplanement and Commercial Operations Forecasts						
Average Seats per Departure	19.00	19.00	19.00	19.22	19.33	19.55
Boarding Load Factor	23.5%	25.0%	27.0%	29.0%	31.0%	33.0%
Enplanements per Departures	4.46	4.75	5.13	5.57	5.99	6.45
Annual Enplanements	10,256	15,000	22,000	27,000	33,000	40,000
Annual Departures	2,300	3,158	4,288	4,844	5,507	6,200
Annual Commercial Operations	4,600	6,316	8,577	9,688	11,014	12,400

AIR TAXI OPERATIONS

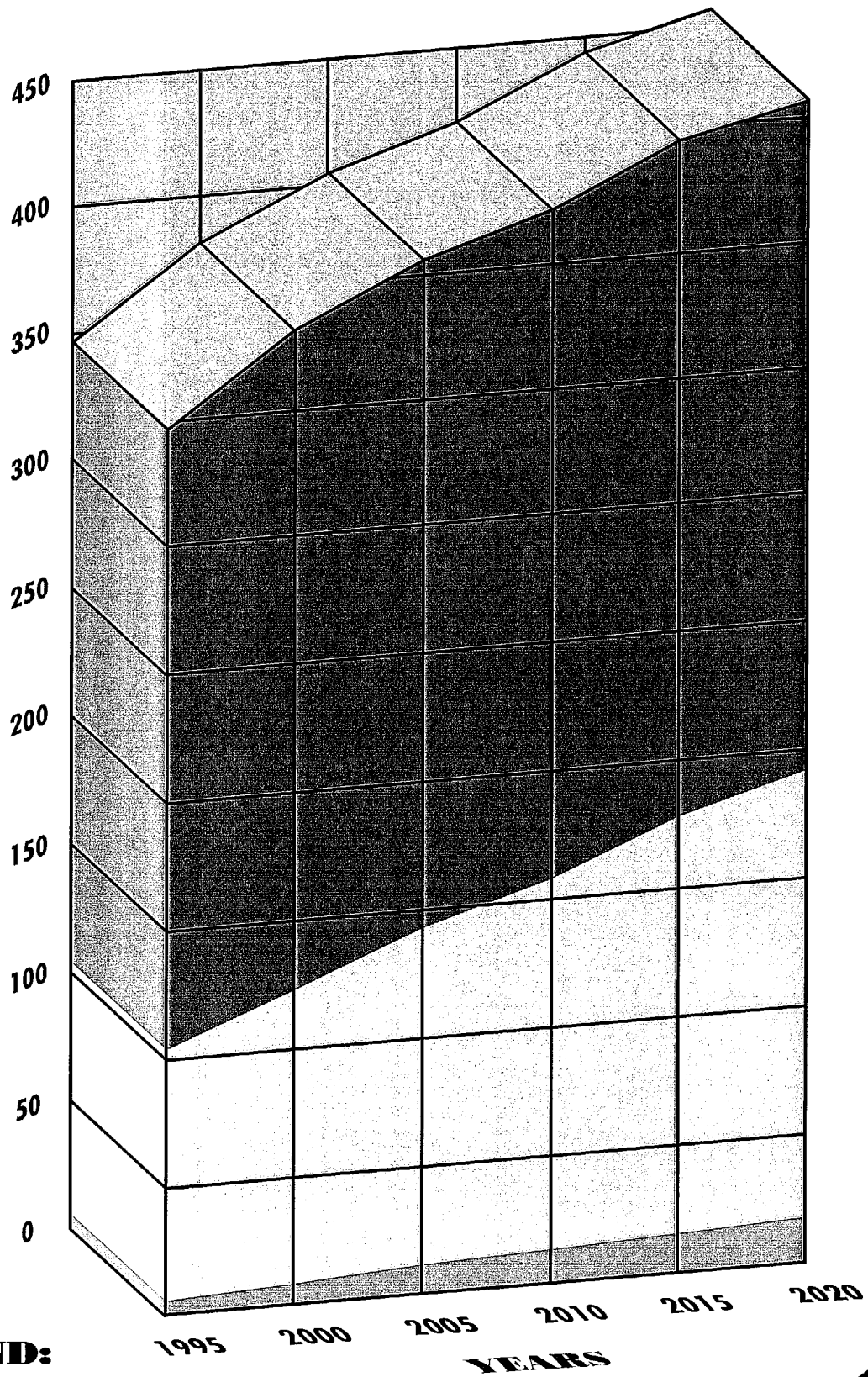
Air Taxi operations (an air carrier certified in accordance with Federal Aviation Regulation (FAR) Part 135 and authorized to provide, on demand, public air transportation of persons or property for hire and operates small aircraft) in 1995 totaled approximately 1,800 operations or approximately 39 percent of the total commercial operations. It is anticipated that air taxi operations will increase slightly to approximately 44 percent by the end of the planning period as the airport continues to attract additional business

activity. Air taxi forecast operational levels are included in the summary table at the end this chapter.

ANNUAL INSTRUMENT APPROACHES

Forecasts of annual instrument approaches (AIA) provide guidance in determining an airport's requirements for navigational aid facilities. An instrument approach is defined by FAA as *"...an approach to an airport with intent to land by an aircraft in accordance with an Instrument Flight*

**ANNUAL OPERATIONS
(in thousands)**



LEGEND:

-  COMMUTER/AIR TAXI
-  NON-ERAU
-  ERAU



Rule (IFR) flight plan, when the visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude."

In determining the number of AIA's conducted at the airport, the number of itinerant operations needed to be examined. Utilizing all airline and air taxi operations, all military operations, and only itinerant general aviation operations, the number of AIAs were estimated.

According to historical FAA data, actual instrument approaches were approximately 1.6 percent of annual itinerant operations. Utilizing the number of annual itinerant operations,

the number of AIA's were calculated for the planning period. The number of AIA's are expected to increase gradually throughout the planning period as commercial operations increase and more sophisticated general aviation aircraft operate at the airport. It should be understood, however, that the total number of instrument approaches conducted at Ernest A. Love Field are significantly higher than the number of AIA's. This discrepancy is because the definition of AIA's does not include practice instrument approaches, which ERAU conducts a significant number. With this in mind, the forecast of AIA's at the airport are described in **Table 2M, Annual Instrument Approach Forecast**.

TABLE 2M
Annual Instrument Approach Forecast
Ernest A. Love Field

	Existing	Forecast				
	1995	2000	2005	2010	2015	2020
Annual Itinerant Operations	117,378	123,202	132,854	139,317	147,710	154,296
Annual Instrument Approaches	1,878	1,971	2,126	2,229	2,363	2,469

PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods. The periods used in developing facility requirements for this Master Plan are:

- **Peak Month** - The calendar month when peak aircraft operations occur.
- **Design Day** - The average day in the peak month. Normally, this indicator is easily derived by dividing the peak month operations by the number of days in the month.
- **Busy Day** - The busy day of a typical week in the peak month. This descriptor is used primarily to determine general aviation ramp space needs.

- **Design Hour** - The peak hour within the design day. Design hour is used particularly in airfield demand/capacity analysis as well as for terminal building and access requirements.

It is important to note that only the peak month is an absolute peak within a given year. All the others will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without over-building or being too restrictive.

GENERAL AVIATION PEAKING CHARACTERISTICS

The general aviation peaking characteristics at Ernest A. Love Field were estimated from an analysis of estimated monthly operations in the year 1995. The peak month, October, was approximately 11.1 percent of annual general aviation operations. For planning purposes, the peak month has been projected to remain at 11.1 percent of annual general aviation operations throughout the planning period.

The Design Day will vary depending on the number of operations during the peak month. At Ernest A. Love Field, the average day was determined by dividing the peak month operations by 31 (the number of days in the peak month).

General aviation Design Hour operations typically range between 10 and 15 percent of the average day depending on the total activity. The Design Hour activity at Ernest A. Love Field has been projected to remain at a

constant 15 percent throughout the planning period.

The definition of general aviation pilot/passengers (Design Hour Pilot/Passengers), as used in this section, refers to the average number of pilots and passengers expected to utilize the airport's general aviation terminal facilities during a given time. Touch-and-go operations would be an exception to the higher passenger levels anticipated. Pilots conducting touch-and-go operations may only use the terminal facilities at the start and finish of their training activity. According to Airport Traffic Control logs, approximately 68 percent of the general aviation operations are training in nature. In order to ensure that space requirements are not overestimated in the planning effort, these operations were not considered in determining design hour pilot/passengers. In calculating the design hour passengers, an average of 2.5 pilot/passengers per design hour operation, excluding training operations, was assumed for the existing condition. It is anticipated that this assumption would remain constant throughout the planning period. The general aviation operation peaking characteristics are depicted in **Table 2N, Forecast Peaking Characteristics**.

COMMERCIAL SERVICE PEAKING CHARACTERISTICS

For this analysis, commercial service peaking characteristics have been divided into two sections; enplanements and operations. The commercial service peaking characteristics are described in the following paragraphs.

Enplanement Peaking Characteristics

According to 1995 enplanement data, the peak month for enplaned passengers occurs in the month of October with approximately 9.5 percent. For planning purposes, the peak month is projected to remain relatively constant at 9.5 percent throughout the planning period.

The Design Day, also referred to as the average day of the peak month, will vary from year to year depending on the number of enplanements during the peak month. At Ernest A. Love Field, the design day enplanements were determined by dividing the peak month enplanements by 31 (the number of days in the peak month).

Design Hour enplanements are used to establish peak hourly demand affecting terminal facilities. The Design Hour enplanements at Ernest A. Love Field are affected by the airline schedules. By the end of the planning period, the percentage is expected to be 15 percent of the Design Day.

The forecast of enplanement peaking characteristic at Ernest A. Love Field are presented in **Table 2N**.

Commercial Service Operation Peaking Characteristics

According to the 1995 commercial service operational data, the peak month for commercial service operations occurred in the month of July with approximately 15.6 percent of the total. As with the enplanement peaking characteristics, this percentage is expected to remain relatively constant at 15.6 percent throughout the planning period.

The Design Day percentage was determined by dividing the peak month commercial operations by 31 (the number of days in the peak month).

Current Design Hour operations were estimated to be 10.0 percent of the Design Day operations. This percentage is expected to remain constant throughout the planning period. The commercial operation peaking characteristics for commercial service are depicted in **Table 2N**.

The peaking characteristics were applied to the forecasts of general aviation operations, annual enplanements, and annual commercial service operations to obtain future peaking data at Ernest A. Love Field. A summary of the total, commercial service, and general aviation peaking characteristics are presented in **Table 2N**.

TABLE 2N
Forecast Peaking Characteristics
Ernest A. Love Field

	Existing	Forecast				
	1995	2000	2005	2010	2015	2020
Total Operations (including Commercial Service, Air Taxi, General Aviation, and Military)						
Annual	346,684	381,842	405,094	421,757	443,750	459,856
Peak Month	38,489	42,666	45,348	47,247	49,747	51,597
Design Day	1,242	1,376	1,463	1,524	1,605	1,664
Design Hour	186	206	219	229	241	250
General Aviation Operations (includes ERAU)						
Annual	340,281	373,000	393,000	408,000	428,000	442,000
Peak Month	37,771	41,403	43,623	45,288	47,508	49,062
Design Day	1,218	1,336	1,407	1,461	1,533	1,583
Design Hour	183	200	211	219	230	237
General Aviation Pilot/Passengers						
Design Hour Pilot/Passengers	146	160	169	175	184	190
Commercial Service Operations (does not includes Air Taxi)						
Annual	4,600	6,316	8,577	9,688	11,014	12,400
Peak Month	718	985	1,338	1,511	1,718	1,934
Design Day	23	32	43	49	55	62
Design Hour	2	3	4	5	6	6
Passengers Enplanements						
Annual	10,256	15,000	22,000	27,000	33,000	40,000
Peak Month	1,097	1,605	2,354	2,889	3,531	4,280
Design Day	35	52	76	93	114	138
Design Hour	5	8	11	14	17	21

SUMMARY

This chapter has provided unconstrained forecasts for those indicators of aviation demand that are essential to effective analysis of future facility needs of the Ernest A. Love Field. The next step in the master planning process is to assess the capacity of the existing facilities and to

determine what facilities will be necessary to meet future aviation demands. **Table 2P, Summary of Unconstrained Forecasts**, is provided as a summary of forecast information for referral in later portions of the study. **Exhibit 2F, Operations Forecast Summary**, graphically illustrates the forecast operations by category.

TABLE 2P
Summary of Unconstrained Forecasts
Ernest A. Love Field

	Existing	Forecast				
	1995	2000	2005	2010	2015	2020
Based Aircraft (includes ERAU)						
Single Engine	224	236	247	262	272	284
Multi Engine	33	40	46	52	60	66
Turbo Prop	0	2	4	4	10	14
Jet	1	1	1	3	5	7
Rotorcraft	0	1	2	2	3	3
Total Based Aircraft	258	280	300	325	350	374
Annual Itinerant Operations						
Commercial	4,600	6,316	8,577	9,688	11,014	12,400
Air Taxi	1,803	2,526	3,517	4,069	4,736	5,456
General Aviation	35,975	39,360	45,760	50,560	56,960	61,440
ERAU	75,000	75,000	75,000	75,000	75,000	75,000
Itinerant Ops Subtotal	117,378	123,202	132,854	139,317	147,710	154,296
Annual Local Operations						
General Aviation	54,306	83,640	97,240	107,440	121,040	130,560
ERAU	175,000	175,000	175,000	175,000	175,000	175,000
Local Ops Subtotal	229,306	258,640	272,240	282,440	296,040	305,560
Total Annual Operations	346,684	381,842	405,094	421,757	443,750	459,856
Passenger Enplanements						
Annual Enplanements	10,256	15,000	22,000	27,000	33,000	40,000
Annual Instrument Approaches	1,878	1,971	2,126	2,229	2,363	2,469